



**UNITED STATES DEPARTMENT OF COMMERCE**  
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/903,486 07/29/97 FORBES

L 303.326US1

MM12/0902  
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EXAMINER

MINTEL.W

ART UNIT

PAPER NUMBER

2811

DATE MAILED:  
09/02/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trad marks**

## Office Action Summary

Application No.

08/903486

Applicant(s)

Forbes et al

Examiner

William Mintel

Group Art Unit

2811

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

☒ Responsive to communication(s) filed on July 19, 1999

☒ This action is FINAL.

- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-36 is/are pending in the application.
- Of the above claim(s) 16-21 is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-15, 22-36 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
  - ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.
  - ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_
  - ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 9
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

Office Action Summary

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1. The disclosure is objected to because of the following informalities: The specification contains grammatic or other errors. Examples are below. To be fully responsive to this action applicant must make a bona fide attempt to correct any other errors. In the claims, claim 35, line 1, "an", is extraneous. Applicant should note that the July 19, 1999 amendment for page 7, line 5, could not be entered because it would not make sense to do so.

Appropriate correction is required.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (766) in view of Oyama (367).

4. Chen (766) in fig. 1 shows a memory cell 10 with poly Si control gate 16, nonocrystal SiC floating gate 34, active semiconductor layer 22, and insulating substrate 20. See column 3, line 35.

Chen does not explicitly recite electrically interconnected gate 16 as SiC. Note column 4, line 13, does recite SiC for gate 34, but this gate is floating, not electrically interconnected.

5. Oyama in the English Abstract, under "purpose", teaches use of SiC in a MOSFET gate 41 to prevent device deterioration. Therefore, in re claim 1, because of Oyama, it would have

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been obvious to use SiC instead of poly Si in the control gate 34 of Chen to improve the stability of the memory device. In re claim 8, the substrate of Chen is insulating, as noted above.

6. Claims 2-7, 9-15, 22-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Oyama as applied to claims 1 and 8 above, and further in view of Halvis and Forbes (401).

7. Oyama is described above but the English Abstract lacks explicit mention of polycrystalline or microcrystalline SiC. Halvis at column 2, lines 20-30, teaches use of a poly SiC gate to make the formation of the underlying gate oxide easier. Forbes at column 2, lines 9-10, teaches micro SiC as a good conductor. Therefore, in re claims 2 and 3, it would have been obvious because of Halvis and Forbes, for the above reasons, to use poly or micro SiC as the gate of Chen. In re claims 3-5, the English Abstract of Oyama does not specifically mention channel type except to recite an N type substrate 1, but it is well known to one of ordinary skill that MOSFET's exist as PMOSFET's or NMOSFET's. In re claim 6, the abstract, line 3, of Halvis teaches 50% carbon. In re claims 9-10, column 3, line 5, of Forbes teaches a 100A oxide insulating layer. Claims 11-14 are rejected as per the above claims. In re claim 15, Forbes at column 1-32, teaches use of a SiC FET in a memory array context. The remaining claims are rejected as per the above features.

8. Cited for a SiC gate on an insulating substrate is Ukai, and also is Japan (678). Cited for SiC without an insulating substrate are Forbes (477), lee, Sugita (878), Japan (681).

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9. Applicant's arguments with respect to claims 1-15, 22-36 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Mintel whose telephone number is (703) 308-4916. The examiner can normally be reached on Monday-Thursday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Mintel/ds

08/25/99

*William Mintel*  
William Mintel  
Primary Examiner  
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